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The Waters of

Llandrindod Wells:

THEIR ACTION & USES

A Medical Guide to the Springs

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*With Dr. Bentley,
Compliments*

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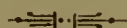
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PREFACE.

Owing to the yearly increasing popularity of Llandrindod Wells as a Health Resort in Summer, and the growing importance of its therapeutic value as a Spa, the author has put together these few pages. He has tried to sum up its most salient points from a medical point of view, for the use of physicians who may desire to send cases there for treatment. He is indebted for valuable hints to the writings of Dr Desgeorges, the late Dr. Bowen Davies, and others.

It is hoped that these few medical data may lead to a still further knowledge and appreciation of these valuable therapeutic springs, and so be the means of bringing health to many more who may suffer from infirmities for the cure of which the Springs of Llandrindod are justly renowned.

A. J. M. B.



LLANDRINDOD WELLS
(Summer).

Helouan les Bains, near Cairo
(Winter).

THE WATERS OF LLANDRINDOD WELLS:

Their Action and Uses.

A MEDICAL GUIDE TO THE SPRINGS.

I. LLANDRINDOD WELLS is a town in Radnorshire, built on a plateau 700 to 800 feet above sea-level, surrounded by a range of hills. some miles off, 2000 feet high, called the Radnor Forest.

The air is very bracing and remarkably pure, owing partly to position, and partly to the fact of there being no manufactory within many miles, and so nothing to contaminate it; the whole county up to Cardigan Bay, on the west, is devoted to agriculture.

Llandrindod and the immediate vicinity are exceedingly rich in mineral springs. They have been frequented by the Welsh themselves for over 200 years, but appear to have been first brought to general public notice by Dr. Linden, a spa specialist, who visited the place and wrote a treatise on its waters in 1754, and who states, "I have not yet met with any of the same kind (of medical waters) that surpass those of Llandrindod."

The springs, which may be classified into Saline, Sulphur, Magnesian, and Chalybeate, arise from

the junction of the igneous rock with the underlying shale formation, the fissures through which it oozes containing Sulphuret of Iron, from which the sulphur and the iron are probably obtained.

II. "The origin of mineral springs is from the central parts of the earth from condensation of vapours which have escaped through fissures in the terrestrial crust."

According to Armand Gautier, the French scientist, "the metallic saline, and aqueous vapours tend to escape upward to the ground, condensing slowly as they become removed farther and farther from the central fire. The metallic bodies and salts are deposited first, then the water vapour becomes liquid, dissolving only the saline and gaseous substances which have remained soluble in these conditions of decreasing pressure and temperature." (*Armand Gautier.*)

This theory is in contradistinction to the usual idea that mineral springs owe their origin to moisture and rain finding its way into the soil, and dissolving there mineral substances on its way downwards, and "accounts better for the special properties of mineral waters."

III. *Composition of the Waters*: Llandrindod Wells may be regarded as belonging essentially to the SALINE type of mineral waters, with the addition in some of the springs of Sulphur, Iron, Magnesia, and Lithia, in varying proportions and strengths, according to the group from which they are obtained.

There are three distinct groups of springs at Llandrindod:—

- (a) One group is situated at the Pump House, on the south-east side of the town. They comprise saline and sulphureous water.

(b) A second group of springs is situated at the south-west of the town in the Rock Park grounds. These comprise saline, sulphureous, magnesian, lithia and chalybeate waters.

(c) The third group is situated on the Public Recreation Ground in the centre of the town. These comprise a strong magnesium-saline, and a calcium-saline spring.

Radium is said to have been found in an appreciable quantity in some of the springs, which would account for the greater efficiency of these with radio-activity over those waters where the composition is only due to a mixture of identical salts.

The three great classes of mineral waters, saline, sulphur and chalybeate, are found at Llandrindod Wells at one spring or the other. All the springs, like those of Homburg and Kissengen, are non-thermal. The saline are generally served hot the water being heated by passing it through coiled pipes in hot water, thus retaining the gases.

It would be tedious repetition to give a detailed account of all the different springs; suffice it to give one of each, remembering that the *amount* of salts in the saline groups varies from 247 grains to 415 grains per gallon. and consist chiefly of the chlorides of sodium, calcium potassium and magnesium. The gaseous contents—oxygen, nitrogen, and carbonic acid, also vary in *quantity* only, in one case amounting to 9 inches per gallon.

All the SALINE waters are laxative, diuretic and alterative in their action, according to the quantity taken and the mode of administration; they increase the appetite. assist digestion, and accelerate tissue

change and the removal of waste products of metabolism from the system.

They are especially useful in atonic forms of dyspepsia due to alcoholic excess and errors of diet, accompanied with irregular action of the bowels and flatulence. They are useful also in liver congestions, tropical liver, duodenal catarrh, and jaundice dependent on catarrh of the gall ducts, &c., especially in those forms due to residence in the tropics.

Their action, owing to the comparatively small amounts of salt they contain, is not drastic; they therefore can be taken for a lengthened period without causing irritation of the bowels or kidneys, and are therefore safe and efficacious in gouty conditions. In fact, their purgative action has sometimes to be helped by the addition of a little Glauber's salts or Magnes sulph., for unless free evacuation is obtained abdominal discomfort, etc is distressing. Further detail as to method of administration, etc., will be given under "The 'Cure' and its Physiological Effects."

The SULPHUR waters in general use are three in number: (1) The Old Pump House Spring; (2) The Rock Park; and (3) The Recreation Ground.

They differ chiefly in the amount of sulphuretted hydrogen they contain, *i.e.*, three, four and fourteen inches to the gallon, with some sulphides and sulphates and chlorides of sodium, calcium, magnesium and potash salts.

The strong sulphur spring contains more H_2S than the old sulphur spring of Harrogate: a difference in strength in any spa constitutes an advantage over other spas which have only one strength, as in

some cases a mild sulphur may be borne better than one of greater strength. A water of three different strengths can be taken direct from the springs here without requiring any artificial dilution.

Sulphur water is diuretic and alterative, and has a sedative effect on the mucous-membranes of the stomach and excretory organs, as well as the skin. They are not aperient in their action, but decidedly diuretic, and therefore especially useful in chronic inflammatory conditions of the bladder and urinary tract and of the intestinal mucosa, due to a long residence in the tropics, accompanied by irregular bowels or diarrhœa, due to a chronic entero-colitis.

The CHALYBEATE IRON springs are situated in the Recreation Ground and in the Rock Park grounds. They are both salines, and in addition the Recreation chalybeate contains a considerable amount of calcium salts, rendering it extremely valuable in all forms of strumous complaints associated with anæmia, debility, and glandular enlargements. They contain besides 1·26 grains of carbonate of iron to the gallon. Their clinical beneficial effect, however, is out of all proportion to this small amount of iron, which is probably enhanced by the radio-activity present in these springs.

Their therapeutic action is also well seen in cases of anæmia combined with torpidity of the digestive organs, uterine congestions, and convalescence from acute diseases.

The lithia and magnesia springs are both situated in the Rock Park grounds. In the former, salts exist to the amount of 8 grains and the latter 49·42 grains to the gallon. They are both taken warm before breakfast as with the ordinary saline, and are efficacious in gouty conditions and the dyspeptic conditions respectively.

THE "CURE."

The Llandrindod course or "Cure" is generally reckoned to take twenty-one days, and consists principally in drinking the mineral waters. In many cases external treatment such as baths, massage, etc., are resorted to as well.

The saline is always taken before breakfast, generally from four to six tumblerfuls, each containing ten ounces. For delicate persons and women it is often less. Sometimes another tumblerful may be ordered at 11 a.m., but never later in the day. Each glass should be followed by active exercise. It is generally taken hot, sometimes cold, never lukewarm. It is not safe to take these waters except under medical advice. There are several conditions in which the "cure," *i.e.*, drinking the water, are contra-indicated, as will be seen later on.

Sometimes visitors diagnosing their own case take much larger quantities than are given above, and without ill-consequences to themselves, but it is not safe to do so: they should remember the old adage, "The Doctor who treats himself has a fool for a patient."

As a rule, it is advisable to take the saline on an empty stomach, but in some cases, especially in delicate subjects a light breakfast may be allowed; while for real invalids the waters are ordered to be taken in bed before dressing. The treatment, however, is in taking the waters *direct* from the springs. The saline bottles well, the sulphur indifferently, chemical changes taking place soon after it is drawn, while the chalybeate can only be drunk at the spring, the carbonate rapidly changing into an insoluble oxide of iron on standing.

The "waters" do not agree in all cases sent for the "cure." Stomach cases, as a rule, require smaller doses, while liver diseases, gout, diabetes, etc., stand larger quantities: neurasthenics and cases of debility following acute diseases, overwork and influenza, are better without any—the quiet open-air life in the bracing air of Llandrindod brings about recovery.

EXTERNAL TREATMENT.

In addition to the "Drinking the Waters," which in Llandrindod is by far the most important part in the "cure," some patients have to undergo external treatment by baths, or certain accessory forms of treatment such as lavage, douches, as Plombieres treatment, Douche-massage, or Electro-therapy.

Baths are provided at Llandrindod in great variety, such as the Sulphur Immersion, Reclining, Circular-Needle, and douche baths of various kinds.

Douches cause, as is well known, quite different effects according to the way they are given, as "regards pressure, temperature and duration of the douche; when short and cold they are exciting, and tonic; when tepid and of greater duration they are more or less sedative." The Ascending Douche or Plombiere treatment consists in allowing water to flow into the rectum for some two or three minutes. It has a "cleansing and soothing effect on the mucous-membrane, strengthens the muscular coat, and is useful in some cases of constipation." I have seen great benefit derived from this treatment in cases of chronic anæbic dysentery, and in engorgements of the liver and spleen in cases recently returned from the tropics.

Massage is very useful in some forms of "gout,

obesity, congestions of the various organs originating in sluggish tissue change," by its stimulating action on nutrition and metabolism.

The Aix douche, so valuable in rheumatic and gouty conditions and obesity, can now be had at Llandrindod at the New Establishment, where at the same time all forms of electricity are available, such as the Dowsing Light baths, the Blue and Red Light Reclining, High Frequency, the Schnee four-celled Battery, the Tyrnæur apparatus for treatment by hot air, an X-Ray installation, and the Plombiere treatment. Many of these forms of treatment can be obtained also at the Pump House Baths and at the Rock Park.

PHYSIOLOGICAL EFFECTS OF THE "CURE."

These are difficult to assess at their proper value. "Though the principal effects seem to be on the digestive organs and on the intestinal tract, there is no doubt that it has a decided influence on all the organs of the body," secretory and excretory.

The stomach is cleaned, acidity corrected. In splenic and hepatic hyperæmia, especially that form due to a residence in tropical climates, the congestion disappears. Constipation, with its attendant evils, flatulence and bilious disturbance, is relieved, probably the "liver cells washed by the saline water cleanse themselves of their waste products, and are thus given a renewed activity. The circulation through the portal system is more active, the abdominal organs at the same time, freed from congestion, act better." The intestinal circulation is at the same time improved, more food is absorbed. The weight in diabetes is increased, and thirst

disappears in many cases, together with the sugar from the urine. Whether these effects are due altogether to the waters, or to the waters and exercise combined, it is difficult to say.

Action on the Blood pressure: This is, as a rule, diminished, partly no doubt caused by the purgative effect on the bowels, and also the diuretic effect, the two ridding the system of much effete matter, with consequent relaxation of the capillary system.

The urine is usually increased in quantity, the amount of urea excreted is increased, and uric acid decreased, "due to increased tissue change brought about by the cure."

Some patients can stand the whole course of 21 days without any untoward effects. In others I have noticed, after a variable period, some gastric derangement with bilious diarrhœa set in, together with loss of appetite, etc. In these it is necessary to stop the "cure" for a time, to allow the excretory organs to have a rest: this condition is probably due to an "excess of toxins in the blood due to the liver and other organs being worked on by the cure." After a rest, the treatment can be resumed to the end.

In others, again, the full benefit is not felt at the time. This is especially noticeable in those who have undergone some form of electrical cure, such as the High Frequency, the effects being apparently cumulative and continuing to act beneficially for some weeks after the patient has left the spa. It is not, therefore, till some weeks have elapsed after treatment that the real effects of the "cure" can be fully appreciated.

*GENERAL RULES TO BE OBSERVED
by Patients undergoing the "Cure."*

It is not possible in a short paper like this to attempt anything but a general line for patients to follow while drinking any of these waters. Individual cases require individual care, as to baths, diet, and exercise. These should be rigidly laid down by the physician, and religiously carried out by the patient. I shall refer here to diet as being the most important.

Only eat what you know you can digest. The stomach should never be overworked by heavy or too frequent meals. No food or drink should be taken between meals. Drink little at meals – a glass or two of claret or other light wine. Don't smoke too much or too heavy tobacco or strong cigars; go to bed early and rise early. In a word, careful diet and good general hygiene, combined with hydrotherapy or whatever accessories the physician orders, carefully and scrupulously carried out, will, with the bracing, exhilarating air of Llandrindod, effect a cure where a cure is possible.

DISEASES FOR WHICH THE WATERS PROVE USEFUL.

- (1) Constitutional Disorders, originating or imputable to disorders of Nutrition, *i.e.*, gout, diabetes, chronic rheumatism, lumbago, obesity, migraine, rehumatoid arthritis, sciatica.
- (2) Diseases of the Stomach and Intestines, *i.e.*, dyspepsia in its varied forms, chronic gastritis constipation from intestinal atony and constitutional peculiarities, etc., enteritis, mucous colitis, hæmorrhoids, etc.

- (3) Diseases of the Liver and Spleen, *i.e.*, jaundice. congestion of the portal system, chronic enlargement from residence in the tropics etc.
- (4) Renal Diseases, *i.e.*, renal calculus, chronic inflammation of the bladder and urinary tract, albuminuria dependent on digestive disturbances or a gouty constitution.
- (5) Certain Skin Diseases, *i.e.*, eczema—chronic and acute lichen, urticaria, some forms of psoriasis and acne.
- (6) Tropical Diseases, *i.e.*, chronic congestions of the liver and spleen, chronic dysentery, chronic entero-colitis, mucous colitis, and tropical cachexia.
- (7) Various Neuroses, such as neuasthenia, irritable heart, asthma, also cases of debility following operations and acute diseases, laryngeal catarrh of gouty origin, glycosuria as distinguished from diabetes, arterio-sclerosis with high blood pressure, and neuritis due to a gouty habit.

GOUT:—

Of all the diseases for which the waters of Llandrindod are regarded as highly beneficial, gout holds the pre-eminence: quite 50% of the cases that come for treatment suffer from this constitutional ailment in one or other of its protean forms. The waters chiefly in vogue are the saline and the sulphur saline, the former taken hot in the early morning on an empty stomach, the latter in the forenoon or afternoon, or at both times. Their action is probably one of elimination in the first place, but their lasting effects are due, as already

stated, to their remedial action in preventing the excessive formation of uric acid. Patients return for a course of waters year after year, having found by experience that by doing so attacks are either altogether warded off, or that acute attacks occur only at long intervals.

DIABETES :—

In this complaint the benefit derived from Llandrindod waters is most marked. I think I cannot do better than quote the remarks of the late Dr. Bowen Davies, who from an experience of 30 years at this Spa, writes as follows :—

“ From my own observation on many patients, I have found that the sugar and amount of urine passed has diminished in quantity, in some permanently, in others for many months, and this without any further restrictions of diet ; and in the majority of cases the amount of new milk taken has been largely increased, and even ordinary bread partaken of freely during the whole course. Whether this benefit can be fairly attributed entirely to the waters, or whether it is not in some measure due to the exercise taken, in the shape of brisk long walks between each glass, and thus ‘burning off’ the sugar, is a question difficult to determine. The weight of these patients almost invariably increases, and the thirst disappears. In the gouty diathesis, where there are no acute symptoms these waters, taken generally in combination with one or other of the sulphur springs, are of great value, especially where there is hepatic atony and a tendency to constipation.”

OBESITY :—

This complaint may be constitutional or acquired by sedentary habits or over-eating. It is chiefly in the former class that the waters of Llandrindod hold a reputation, *i.e.*, the gouty or diabetic obese depending on faulty metabolism. These come in increasing numbers every year, and derive vast improvement from the waters, combined with active exercise and dietetic measures calculated to reduce fat formation. Douches and massage assist greatly the cure.

RHEUMATISM :—

Rheumatic Gout and Arthritis are allied to gout in some way, in what manner it is difficult to determine. We only know that of various members of a gouty or rheumatic family, some may inherit gout, others rheumatism, others a fibrositis, others again some gouty eczema or psoriasis. Whatever the cause, whether to an intestinal microbic invasion according to Dr. Gore, or to uric acid according to others, we know that Llandrindod waters exert marked benefit on any form, combined with local treatment, such as vapour baths, hot-air baths, Dowsing, etc. Some severe cases you can only benefit by these means, by improving the general health, etc.: a cure in these is impossible.

SCIATICA, LUMBAGO, NEURITIS, FIBROSITIS, and
MIGRAINE :—

These painful and distressing common maladies are often connected with a gouty and rheumatic condition, associated with a faulty digestion, and in these a course of waters combined with baths, douches, massages, etc., are often cured. Two very

severe cases last year were completely cured by a course of waters combined with electrical treatment. In some a complete cure does not set in until a month or so after electrical treatment has ceased.

DISEASES OF THE STOMACH AND INTESTINES:—

Llandrindod enjoys a great reputation in the remarkable effect its waters have in the cure of all forms of *Dyspepsia*: quite 20 or 30% of all cases come for relief from some form of this complaint, many of which are of a gouty origin, to which errors of diet, alcoholic excess, or an atonic condition have been superadded.

CHRONIC DYSPEPSIA may be a disease *sui generis*, brought on by dietetic errors, etc., but in by far the greater number it is but a symptom of a constitutional state probably gouty. In these careful dieting combined with hydrotherapy are of first importance. The same holds true where it is associated with *diabetes and liver disturbances of tropical origin*.

In the *atonic forms* combined with *constipation* accompanied with *flatulence* and acid eructations, a course of the saline waters combined with the chalybeate in all cases effects a cure. In cases of hyper-acidity from excess of hydrochloric acid, the salines are not well borne.

CHRONIC GASTRITIS:—

This complaint, where the mucosa is inflamed and irritable, often due to alcoholic excess, the sulphur waters act very beneficially, so much so that Llandrindod has acquired a considerable reputation in the past for the cure of "drink-craving." The soothing sedative effect of the sulphur-saline

on the inflamed mucous membrane of the stomach is very grateful. The tendency to diarrhœa and accompanying urinary irritation is often also relieved by their use.

IN INTESTINAL ATONY combined with constipation, often found with the dyspeptic and favoured by sedentary habits, the saline and chalybeate are indicated, combined with exercise in the bracing atmosphere of the common and golf links. Abdominal massage, a regular diet and, in some cases, the Plombiere douche, are valuable adjuncts.

MUCO-COLITIS, CHRONIC ENTERO-COLITIS, etc., often of tropical origin, but whether dependent on this or on gastric catarrh and defective bile secretion, the course at Llandrindod is often followed by good effects. The constipation which is often present is relieved, the mucous secretion from the bowels lessens, and with these the mental tone improves. Two cases last year made a recovery after years of illness, one on the waters alone, and the other on the waters combined with Plombiere douche.

DISEASES OF THE LIVER AND SPLEEN: --

JAUNDICE is a symptom, not a disease, and may be caused by various conditions: the most common causes for which Llandrindod is suitable are catarrhal and inflammatory condition of the duodenum or gall ducts, or to gall stones from thickened bile.

CONGESTION OF THE LIVER AND PORTAL SYSTEM: from errors of diet, or more often seen after tropical residence, are often greatly and speedily relieved by a course of the saline waters. The irritating toxins or substances circulating

through the hepatic cells are flushed away by the saline, the bile secreted becomes more healthy, circulation through the portal system becomes relieved and accelerated by the aperient action of the "water," assisted in some cases by a dose of *Pil Hydarg.* In no class of cases are the waters more beneficial than in those of active and passive congestions of the liver and portal system.

IN CHRONIC ENLARGEMENT OF THE LIVER from a tropical cause, the above remarks hold equally true, though for these several courses may be necessary, combined with tonics, graduated exercise, and an open air life with strict hygienic and dietetic precautions, before a cure is effected.

CASES OF CHOLICYSTITIS AND CHOLILITHIASIS, leading often to the formation of gall stones, are often greatly benefited by a course of salines. In some cases they may cause the stones to be expelled, but their chief role is in prevention of fresh formations by dissolving inspissated bile and so restoring the functions of the liver that healthy bile only is produced.

DISEASES OF THE SPLEEN, following Malarial infection or Cachexia, in which the enlargement may be combined with hepatic and portal congestion, are much benefited by the waters and the general hygienic conditions imposed by the "cure."

RENAL DISEASES :—

Many cases come to Llandrindod with *Urinary Calculi*: the waters have no solvent effect on those already formed, but from their diuretic action on the kidneys, which are very marked, quite as much so as at many Continental spas, they may, and

often do, dislodge and wash away renal sand and concretions through the large renal flow set up. Again, by their action in diminishing the amount of uric acid secreted, and the acidity of the urine, they tend to prevent the production of uric acid gravel.

CHRONIC URINARY TROUBLE may be, and is, sometimes benefited by a short course of the sulphur waters, but in any acute condition the diuretic action may prove irritating. In slight forms of albuminuria, due to faulty metabolism of gouty origin and chronic in character, the saline are often very beneficial, but in Bright's disease, where there is advanced renal change or high blood pressure, they should be avoided.

CERTAIN SKIN DISEASES :—

Eczema is a very common skin affection seen in Llandrindod, and is, as a rule, curable by a course of the "waters," though some sedative to allay the irritation present has often to be given. This complaint, and *Psoriasis*, are in the majority of cases of gouty origin, which accounts for their rapid disappearance under the "waters." Dependent as it is on a constitutional cause, it is liable to relapse, necessitating perhaps a yearly visit for a time, before it and the gout are eradicated from the system. These remarks apply equally to other forms of skin disease dependent on a constitutional cause, such as *acne* on gouty dyspepsia, etc.

TROPICAL DISEASES :—

These, so far as this paper is concerned, may all be classified under the term of Malarial Cachexias, a "group of conditions more or less chronic, due

to prolonged exposure to malarial influences from long residence in the tropics, and accompanied by hepatic enlargement and abdominal congestion.”

—*Manson.*

An increasing number of these cases have been coming to Llandrindod every year, and to other resorts such as Carlsbad, Harrogate, Vichy and Kissingen. There is no doubt as to the good effects derived from a course of waters combined with the tonic effects of the bracing air of Llandrindod.

Under a course of waters the abdominal organs get rid of their congested condition and of the waste products in the circulation. The portal and splenic circulation is relieved, the appetite improves, gastric troubles disappear, and general health is restored.

I have seen cases where diarrhoea has existed for years quite recover under a single course of the waters, and in another, a persistent chronic dysentery cured by the Plombiere douche, where every other form of treatment and strict dietary had proved useless.

All forms of *Liver Congestion*, whether due to malaria, dysentery, or arising from a lengthened stay in the tropics, are benefited by a course of the waters.

VARIOUS NEUROSES :—

Neurasthenics are often considerably benefited by a stay in the bracing air of this spa. The rest and quiet of the place and the opportunity for an open air life all combine to make a rapid recovery.

The majority of these cases are better without taking the waters. Tonics, good food, regular

exercise, in a word, good general hygienic conditions, are in themselves quite sufficient.

ASTHMA is a doubtful class. Some improve, some get worse.

GLYCOSURIA is markedly benefited, in many cases cured.

ANÆMIA AND DEBILITY, whether from overwork, influenza, or following other acute illness, are benefited by the bracing air, freedom from bustle and noise, and in some by a short course of the chalybeate waters.

CONTRA INDICATIONS.

Acute stages of any disease: these conditions, as well as acute exacerbations of chronic complaints, are not adapted to any kind of bath treatment.

No case with a rise of temperature, either with or without suppuration, is suitable, owing to the exciting action on the whole system of the "cure." Patients therefore suffering from large sores or abscesses are not suitable.

Epilepsy, malignant tumours, pulmonary affections, and hæmoptysis are debarred.


When the organs of the body, such as the kidneys, liver, heart, &c., have undergone marked degeneracy, such as fatty degeneration, advanced Bright's disease, aortic incompetency, &c., baths and large draughts of saline should be taken with the greatest caution, if at all, certainly not without medical advice.

Some forms of chronic tuberculosis occurring in gouty subjects when not active may be improved by the waters, but in all the febrile or advanced cases they are contraindicated.

Several deaths have occurred in people suffering from the above diseases and taking these waters.

NATURAL AND OTHER ATTRACTIONS OF LLAN- DRINDOD WELLS :—

The *climate* of Llandrindod is favourable for invalids. It is bracing and dry—the town is on a plateau nearly 800 ft. above sea level, the rainfall is only 32 inches. The surface of the ground and the footpaths dry very quickly after rain, little trace of a heavy shower being visible after an hour's interval.

 The surrounding country is pretty, though the town itself is the reverse. The country walks over hill and dale are endless in their variety, and exceedingly beautiful. A quotation from an article which appeared in *The Church Times* in 1907 emphasises this :—

“ We have spent a week in this charming Welsh spa, Llandrindod, which means ‘ Church of the Trinity,’ and we have come to the conclusion that it is a most attractive place, though circumstances have prevented me from making the excursions which I yet hope to make. The enrapturing wealth of wild flowers in the hedgerows, honeysuckle, wild roses, meadowsweet, grasses of hundred species, small flowers of all kinds—well, perhaps country readers may not enter into my enthusiasm, but I am a Londoner, and though I once was familiar with these beautiful things, I doubt whether

I have ever at home or abroad had more beautiful roadside walks than here."

"There are certain hours for the water drinkers. They begin at seven o'clock in the morning ; the band is ready outside the Pump Room to welcome them, and it plays at intervals throughout the day. We heard it strike up this morning with the familiar tune, ' Who are these like stars appearing ? ' The second batch of patients went up at eleven, and it was with much interest that I went up and took a good look at them. There is a big room, with a large and commodious ' bar,' where ' neat-handed Phyllis ' serves out the drink busily. Hundreds of patients were sitting round drinking. It was raining, so I presume they sat still under shelter when otherwise they would have been taking exercise after it, for I suppose things are as they were in the days of old, when ' Mr. Pickwick drank half-a-pint before breakfast and walked up a hill, and another half-a-pint after breakfast and then walked down a hill, and after each half-pint emphatically declared himself better, which his friends were much delighted to hear, though they were not previously aware that there was anything the matter with him.' The curative power seems here to be a reality, at any rate, great hygienists recommend it very earnestly, and some of the patients certainly do drink surprising quantities. I see the guide books warn visitors not to imbibe without medical sanction. I, for one, following my doctor's advice, have not taken any. It is sufficient for me that I am on an elevation 700 feet above the sea, and with a perfectly delightful, healthful breeze blowing from the hills."

The town itself is healthy: the death rate in 1908 was 5·5 per 1,000. Notifiable diseases are

practically nil. The temperature is very even, the daily variation slight.

For the amusement and recreation of those who are not too ill to enjoy them, there are

1. The *Golf Course*, situated on a hill 1,200 feet above sea level, to which a char-a-banc runs frequently during the day, though the walk through the woods skirting the lake is quite worth the trouble for those who walk. The air is exhilarating, the views round superb. There is a good pavilion, where refreshments can be had. The course, one of the best in England, was laid out by Vardon, and is under the care of a professional.

Another golf course, 18 holes, near the Rock Park, is also available for beginners. This one is not under the care of a professional.

There is fair *angling* to be got in the river Ithon, which runs round the town. The water is preserved, but tickets to fish can be obtained for a small sum from the Llandrindod Wells Fishing Association.

Boating can be had on the lake.

Llandrindod forms a good centre for *motor tours*, and every requisite for motoring can be obtained in the town from the garage of T Norton & Co.

The footpaths over the "*Common*," and through the town are always in excellent repair, and seats are provided at short intervals everywhere for invalids.

In the *Recreation Ground* paths and seats are also provided. This open space, which belongs to the

public, commands also extensive views of the surrounding country, and being encircled by trees is protected from winds. There are besides here public tennis courts and a bowling green.

In the *Rock Park* are the radium, sulphur and saline springs. There are numerous well laid out paths here, and a pavilion in which Pierrots give performances three times daily.

Last year a Skating Rink was started. During the season, concerts, &c., take place, and in the *Pump House* grounds a band discourses sweet music three or four times daily.

From the above, visitors can see what to expect in the way of amusement and recreation. It would be better, perhaps, if they discounted all blandishments advertised and came and saw for themselves.



THE SALINE

(Old Pump).

ANALYSIS.

Temperature of Spring	...	48 F.
Specific Gravity	... ..	1004·74.
Gaseous Contents	... ..	at 48 F. and 30 Bar.
Oxygen	... ..	2·52 cubic inches per gallon.
Nitrogen	... ..	6·27 " "
Carbonic Acid	... ..	·35 " "
		<hr/>
		9·14 " "

MINERAL CONSTITUENTS.

				<i>Grains per Imperial Gallon</i>
Chloride of Sodium	...	...	...	334·24
Chloride of Potassium	...	...	...	2·10
Chloride of Calcium	...	...	...	68·43
Chloride of Magnesium...	...	...	...	2·61
Chloride of Lithium	...	...	...	strong trace
Chloride of Thallium	...	...	...	a trace
Carbonate of Calcium	...	...	...	3·50
Carbonate of Ammonia...	...	...	...	·23
Nitrate of Calcium	...	...	...	·41
Oxides of Iron Alumina	...	...	...
Phosphates of Iron and Alumina	...	...	...	1·17
Sulphate of Calcium	...	...	...	1·15
Bromide of Potassium	·02
Silica	1·70
Water of Combination	25·20
				<hr/>
			Total grains	... 440·76
				<hr/>

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*Analyst for the Counties of Radnor
and Worcester.*

THE SULPHUR

(Old Pump).

ANALYSIS.

Gaseous Contents	...	...	at 48 F. and 30 Bar.
Oxygen	...	...	·61 cubic inches per gallon.
Nitrogen	...	...	5·77 " "
Carbonic Acid	...	...	1·75 " "
Sulphuretted Hydrogen	2·61		" "
		<hr/>	
	10·72	" "	" "

MINERAL CONSTITUENTS.

					<i>Grains per Imperial Gallon</i>
Chloride of Sodium	...	...	...	...	162·80
Chloride of Potassium	...	...	...	...	a trace
Chloride of Calcium	...	...	...	...	49·21
Chloride of Magnesium...	...	...	...	...	2·61
Chloride of Lithium	...	...	...	...	a trace
Carbonate of Calcium	...	...	...	...	9·00
Nitrate of Calcium	...	...	...	...	·50
Sulphate of Calcium	...	...	...	...	·50
Sulphide of Ammonia	...	...	...	...	·21
Oxides of Iron and Alumina	...	...	...	...
Phosphates of Iron and Alumina	...	...	...	...	·10
Bromide of Potassium	...	...	...	...	·20
Iodide of Potassium	a trace
Silica	2·38
Water of Combination	21·24
				<hr/>	
				Total grains	248·95
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HORACE SWETE, M.D., F.C.S.,

*Analyst for the Counties of Radnor
and Worcester.*

THE
CHALYBEATE IRON SPRING.

ANALYSIS.

Temperature of Spring	...	47·5 F.
Specific Gravity	...	1005·14

MINERAL CONSTITUENTS.

				<i>Grains per Imperial Gallon</i>
Chloride of Sodium	...	...	..	278·30
Chloride of Potassium	...	...	...	1·21
Chloride of Calcium	...	...	...	64·73
Chloride of Magnesium	...	...	...	13·75
Chloride of Lithium	...	...	...	a faint trace
Carbonate of Calcium	...	...	...	·61
Carbonate of Iron	...	...	..	1·26
Carbonate of Ammonia	...	...	...	·14
Nitrate of Calcium	...	...	...	·61
Sulphate of Calcium	...	...	...	·71
Bromide of Potassium	...	...	...	a trace
Iodide of Potassium	...	...	...	a trace
Silica	...	...	...	1·33
Water of Combination	...	...	...	26·25
Total grains				<u>338·90</u>

HORACE SWETE, D.Ph., F.C.S.,
County Analyst for Radnor and Worces ter.

Comparative Table of Analyses of Mineral Springs found at Llandrindod Wells.

MINERAL CONSTITUENTS in Grains and GASES in Cubic Inches per Imperial Gallon					
NAME OF SPRING ..	Radium Red Sulphur Spring.	Chaly- beate Spring.	New Spring.	Magnes- ium Spring.	Lithia Saline Springs.
NAME OF SPA ..	Park Spa.	Park Spa.	Recrea- tion Ground.	Park Spa.	Park Spa.
NAME OF ANALYST ..	Embrey	Swete	Thresh	Swete	Embrey
DATE	1904	1879	1907	1894	1906
Chloride of Sodium ..	80·7	278·30	163·6	236·46	279·8
Chloride of Calcium ..	30·8	64·73	110·9	88·9	73·26
Chloride of Magnesia ..	14·34	13·75	37·7	49·42	14·91
Chloride of Potassium ..	'93	1·21	....	1·4	....
Chloride of Lithium ..	'34	faint tr.	....	trace	3·83
Carbonate of Lithium ..	....	....	....	....	5·7
Chloride of Thallium ..	....	....	....	trace	1·2
Carbonate of Calcium ..	1·6	'61	10·3	....	....
Carbonate of Ammonia ..	....	'14	....	'19	....
Silica	'82	1·33	trace	4·14	....
Nitrate of Calcium ..	....	'01	....	....	....
Sulphate of Calcium ..	....	'71	6·8	....	....
Iron Oxide	'41	....	....	'7	trace
Oxide of Aluminium ..	'3	....	....	1·05	3·34
Carbonate of Magnesia ..	2·47	....	....	....	....
Carbonate of Iron ..	....	1·26	1·6	....	....
Bromide of Potassium ..	....	a trace	....	....	....
Iodide of Potassium ..	....	a trace	....	....	....
Nitrate of Potash ..	....	....	....	....	....
Nitrates .. .. .	....	....	....	traces	....
Nitrites .. .. .	....	....	....	nil	....
Bromide of Sodium ..	....	....	'6	....	....
Iodide of Sodium ..	....	....	trace	....	....
Alumina .. .. .	....	....	trace	....	....
Water of Hydration ..	....	....	13·6	....	....
Radium	strong trace	....	....	....	....
Nitrogen	14·2	....	....	4·28	1·0
Oxygen	8·1	....	....	'23	'5
Sulphuretted Hydrogen	14·35	....	....	'80	....
Carbonic Acid	2·2	....	....	1·60	2·5

Taken from Bufton's Guide to Llandrindod Wells.

Railway Communications and access to Llandrindod Wells.

Llandrindod Wells being a first-class station on the central line of the London & North-Western Railway, it is easily accessible from all parts of the United Kingdom.

The following is a table of distances from some of the principal centres of commerce to Llandrindod Wells:—

From	Miles	3rd class Fare		Route
		s.	d.	
*London	188	15	8	Stafford
*Liverpool	106½	8	10½	Crewe
*Manchester	115½	9	7½	Crewe
Leeds	152½	12	8½	Crewe
Birmingham	86	7	2	Stafford
*Cardiff	69	5	9	Builth Road
*Swansea	64	5	0	Llandovery
Carlisle	215	18	9	Preston
Edinburgh	329½	27	5½	Carlisle
*Chester	90½	7	6½	Salop
*Crewe	81½	7	0½	Salop
*Rugby	123½	10	3½	Stafford
Dublin	190	16	10	Holyhead
Glasgow	316½	26	4½	Carlisle
Llandudno	138	11	6	Chester
*Stafford	80½	6	8½	Salop
*Tenby	88½	7	2½	Llandovery
Hereford	40	3	4	Craven Arms
*Shrewsbury	51½	4	3½	Craven Arms
Rhyl	120½	10	0½	Chester
Derby	114	9	6	Stafford
Denbigh	119½	9	10½	Mold
Oswestry	71½	6	0	Salop
*Pembroke	95	7	0	Llandovery
Neath	65½	5	5½	Builth Road
Newport	72	6	0	Builth Road
Merthyr-Tydvil	49½	4	1½	Builth Road
Ludlow	39½	3	3½	Craven Arms
Abergavenny	62½	5	2½	Craven Arms
*Carmarthen	53½	4	5½	Llandilo
Aberystwith	81½	6	9½	Llanidloes
Bristol	107½	8	11½	Craven Arms
Bath	112	9	4	Craven Arms
Worcester	68½	5	8½	Craven Arms

* Through Carriages run from here.

Tourist Tickets are issued from most places to Llandrindod Wells during the season.